REMARKS

The Examiner rejected claims 1 and 7-9 under 35 U.S.C. 102(b) as being anticipated by Bradford, rejected claim 2 under 35 U.S.C. 103(a) as being unpatentable over Bradford in view of Gibson, and objected to claims 3-6 and 10-15 as being dependent upon a rejected base claim. Applicants have amended claims 1, 4 and 6-15 for clarity, with claims 1-15 remaining in the case.

In contradistinction to Applicants' claimed invention Bradford discloses a stereo display system where the sum and difference of the full-wave rectified left and right stereo channels are applied to the respective X and Y deflection circuits of an oscilloscope for display together with an interpretative legend in the form of a wedge outline. The position and orientation of the line or pattern of curved lines indicate the characteristics of the aural perspective of the sounds, i.e., the principal direction of the sound (balance), the range of directions (separation) and the loudness over the range of directions (modulation). The width of the resulting combined signal on the display indicates "separation", the length from a fixed center point on the screen toward the outer edge of the wedge indicates percent "modulation", and the direction of the centerline of the displayed signal indicates aural "direction" or "balance" of the left and right stereo channels.

Applicants' claimed invention provides a sound stage image, which either spans 180^0 around a fixed center point on a display for conventional stereo comparable to Bradford or 360^0 for surround sound (which is not really addressed by Bradford). A correlation meter scale is provided (with tic marks at +1, 0 and -1) for each sound channel (each corresponding left and right sound channel forming a stereo sound source), and markers related to the correlation meter scale are provided that represent the phase correlation between the corresponding sound channels that make up the stereo sound source. Speaker images may be included as part of the sound stage to indicate relative positions of the sound sources with respect to the center point (listener), and the markers may be either pointers or a fill area, with the thickness of the fill area (width toward the center) indicating the amplitude for each individual sound channel and the width indicating phase correlation between the stereo channel pair. Applicants respectfully submit that

Bradford, either singly or in combination with Gibson, neither teaches nor suggests Applicants' invention as recited in claims 1, 2 and 7-9.

In claim 1 Applicants recite "a correlation meter scale" for each sound channel. A scale connotes a series of marks at known intervals for measuring something. As shown by Applicants this includes marks at +1, 0 and -1 for each left and right sound channel that make up a stereo sound source indicating the correlation between the corresponding sound channels. Bradford has no such marks, and therefore does not teach or suggest the correlation meter scale as recited by Applicants. Further Applicants submit that in fact Bradford has no phase correlation indicators between the corresponding sound channels. Applicants also recite "markers . . . that represent the correlation", which may be in the form of pointers (the distance between them indicating correlation) or fill areas (the length of the fill area indicating correlation). Applicants submit that the signal generated by Bradford's drive of the deflection axes of the oscilloscope by rectified left and right channel sum and difference values does not create "markers", one for each channel. What Bradford displays is a "pattern" which has a single line (for a single tone) or a large number of continuous and irregularly curved lines extending radially from a centrally located fixed point on the screen, forming a single "marker" at best. Therefore Bradford does not represent the correlation between the sound channels that make up a stereo sound source by having "markers", one for each correlation scale. Further Bradford does not show the individual sound channels of the stereo pair separately, but only as a combined signal. The analog signal displayed by Bradford does not correspond to the markers recited by Applicants, and does not display the same information as that recited by Applicants.

For clarity Applicants have amended claim 1 to make clear that the surround sound display represents a plurality of sound channels, and corresponding sound channels (left and right, for example) make up a stereo sound source. Applicants feel that the original language may have confused the Examiner's understanding of the present invention. The remaining claims have been amended to conform to the changes made in claim 1. This amendment is not intended to change the scope of the claims, but merely to clarify the language to overcome a perceived confusion of understanding by the Examiner. The reference to "each stereo channel" may have

led the Examiner to think in terms of multiple stereo sources rather than the individual sound channels that make up a single stereo source. Thus claims 1, 2 and 7-9 are deemed to be allowable as being neither anticipated nor rendered obvious to one of ordinary skill in the art by Bradford, either alone or in view of Gibson.

In view of the forgoing remarks allowance of claims 1, 2 and 7-9 is urged, and such action and issuance of this case are requested.

Respectfully submitted,

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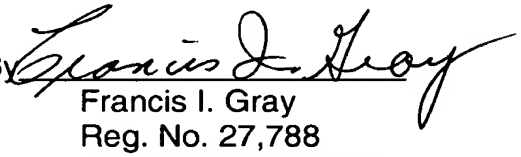
By 
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APPENDIX I

1. A surround sound display representing a plurality of sound channels comprising:

a sound stage image;

a correlation meter scale for each sound channel of the sound stage image that has a corresponding sound channel to form a stereo sound source; and

markers related to the correlation meter scales that represent the correlation between the corresponding sound channels.

2. The display as recited in claim 1 wherein the sound stage image comprises speaker images positioned at appropriate positions of the display to represent sound sources.

3. The display as recited in claims 1 or 2 wherein the sound stage image comprises a listener image positioned in the center of the display.

4. The display as recited in claim 1 wherein the correlation meter scale comprises a bent scale for each corresponding sound channel representing correlation values between +1 and -1 at opposing ends of the bent scale.

5. The display as recited in claim 4 wherein the bent scale has the +1 end centrally located along a first side of the display, the -1 end centrally located along a second side of the display, the second side being orthogonal to the first side, and a central portion representing a correlation value of 0 adjacent a corner between the first and second sides.

6. The display as recited in claim 4 wherein a second bent scale representing a related stereo sound source has the +1 end centrally located along the first side of the display adjacent the first bent scale, the -1 end centrally located along a third side of the display opposite the second side, and a central portion representing a correlation value of 0 adjacent a corner between the first and third sides.

7. The display as recited in claim 1 wherein the markers comprise a pointer for each sound channel, the location of the pointer along the correlation meter scale indicating the correlation between the corresponding sound channels.

8. The display as recited in claim 7 wherein the markers comprise a fill area spanning the correlation meter scales for the corresponding sound channels, the width of the fill area indicating the correlation between the corresponding sound channels.

9. The display as recited in claim 8 wherein the thickness of the fill area indicates the amplitude of each sound channel.

10. The display as recited in claim 1 wherein the correlation meter scales for the corresponding sound channels comprise bent scales each having a +1 value adjacent the other centrally along a first side of the display, respective -1 values centrally along opposing adjacent sides orthogonal to the first side, and 0 values adjacent respective corners between the first and each adjacent side.

11. The display as recited in claim 10 wherein the markers comprise a fill area that spans the correlation meter scales and has a width and a thickness, the width indicating the correlation between the corresponding sound channels.

12. The display as recited in claim 11 wherein the fill area has two contiguous portions, a first portion overlaying one of the correlation meter scales and a second portion overlaying the other one of the correlation meter scales, the thickness of the portions indicating the amplitude of each sound channel.

13. The display as recited in claim 1 wherein the markers comprise a plurality of truncated wedges, at least one of the truncated wedges having a fixed width representing a central audio source and the other truncated wedges representing the corresponding sound channels with a variable width, the variable width indicating the correlation between the corresponding sound channels.

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14. The display as recited in claim 13 wherein the truncated wedges representing the corresponding sound channels have a first radial edge fixed at a +1 value for each corresponding sound channel and a second radial edge variable between the +1 value and a -1 value to alter the variable width of the truncated wedges to indicate the correlation between the corresponding sound channels.

15. The display as recited in claim 13 wherein the truncated wedges for the corresponding sound channels have a minimum width centered at a specified angle representing a 0 value of the correlation meter scales, and a first radial edge is fixed

when the correlation is negative while a second radial edge varies to change the variable width of the truncated wedge and the second radial edge is fixed when the correlation is positive while the first radial edge varies to change the variable width of the truncated wedge.

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